REMARKS

Phone Conference

Applicants would like to thank Examiner Yunsoo Kim for the phone conference held with Applicants' representative. During the phone interview, the provisional double patenting rejection under § 101, the art rejections, and the obviousness type double patenting rejections were discussed. Examiner Kim agreed to consider Applicants' arguments when submitted in writing and to present them to her Supervisor for a final decision.

Examiner Kim also confirmed that an incorrect copending application number (11/514,462) was cited on page 8, paragraph 17 of the Office Action. The correct copending application is 11/516,462.

Status of Claims

Claims 1-97 have been canceled without prejudice or disclaimer of the subject matter claimed therein. Claims 61-97 have been replaced with new claims 98-146. New claims 98-146 are directed to the same subject matter as claims 61-97 and therefore, should be examined.

Amendments to the Claims

Support for new claims 98-146 can be found throughout the specification. Representative support for each of the claims is summarized in the table below.

Claim(s)	Representative Support
98	Claim 61; Page 7, lines 4-6; Page 26, lines 23 and 24; Page 35, lines 19-21 and page 36, lines 8-10
99	Claim 62
100	Claim 63; Page 30, line 5
101, 102	Claim 70
103	Claims 67 and 72
104	Claim 73
105	Claim 71; Page 19, lines 4 and 5
106, 107	Page 21, line 24; Example 5; Page 30, lines 5-17

108	Claim 64
109	Claim 65
110	Claim 66; Page 17, lines 16-19
111	Claim 67
112	Claim 68
113	Claim 69
114	Claim 71; Page 19, lines 4 and 5
115	Page 21, line 24; Example 5
116	Claim 74
117	Claim 76; Page 18, lines 8 and 9; Page 20, line 14; Page 21, lines 8-33; Page 22, lines 19-33
118	Claim 77
119, 120	Claim 8; Page 21, line 24; Example 5; Page 30, lines 5-17
121	Claim 78
122	Claim 79
123	Claim 80
124	Page 6, line 27; Page 8, line 23;
125	Claims 8 and 75; Page 20, line 9
126	Claim 8
127, 128	Page 7, lines 10-13
129	Page 17, lines 16-19
130	Claim 81
131	Claim 82
132	Claim 83
133	Claim 84
134	Claim 85
135	Claim 86
136	Claim 87
137	Claim 88
138	Claim 89

139	Claim 90
140	Claim 91
141	Claim 92
142	Claim 93
143	Claim 94
144	Claim 95
145	Claim 96
146	Claim 97

Provisional Double Patenting Rejection Under 35 U.S.C. § 101

Claims 61, 65, 67, 70, 73, 74, and 81-83 are provisionally rejected under 35 U.S.C. § 101 as claiming the same invention as that of claims 76, 79, 80, 82-84, and 87-89 of copending application 11/143,842.

Claims 61, 65, 67, 70, 73, 74, and 81-83 have been canceled and replaced with new claims. The new claims are directed to the same invention as claims 61, 65, 67, 70, 73, 74, and 81-83.

Applicants respectfully point out that claims 79, 80, 82-84, and 87-89 of copending application 11/143,842 have been canceled. Claim 76 of copending application 11/143,842 is directed to a method of inducing an antigen-specific immune response comprising applying to the skin of a subject, a dry formulation comprising an antigen. In contrast, the currently pending claims of the present application are directed to a method of inducing an antigen-specific immune response comprising applying to the skin of a subject, a dry formulation comprising an antigen and an adjuvant. The claims of the present invention require applying a dry formulation comprising two components while the claim 76 of the copending application only require applying a dry formulation comprising one component. The claimed inventions of the two applications are not the same. Thus, Applicants request withdrawal of this rejection.

Rejection Under 35 U.S.C. § 112, First Paragraph

Claims 63, 68, 69, 75-77, and 81-97 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification (new matter rejection).

Applicants respectfully point out that these claims do not introduce new matter. Representative support for these claims was provided in the previous response, dated October 10. 2006. Representative support for each of the phrases that the Office Action has alleged as new matter is again provided in the table below. Applicants have added additional places in the specification to show support for the phrases. Accordingly, these claims do not contain new matter.

Claims 63, 68, 69, 75-77, and 81-97 have been canceled and replaced with new claims 100, 112, 113, 117, 118, 125, and 130-146.

Claim and Phrase	Representative Support
63 (new claim 100) "chemical conjugate"	Page 17, lines 14-16, 20; Page 14, line 38; Page 11, lines31-32
68 (new claim 112) "virus expresses a glycoprotein"	Page 12, lines 4-8; Page 17, liens 14-19; Page 42, Example 4; Claims 12 and 13;
75 (new claim 117) "genetically detoxified toxins, chemically conjugated bARE"	Page 22, lines 19-33
81 (new claim 130) "pretreating the skin"	Page 37, line 30; Page 7, line 26 to page 8, line 2; Claims 31 and 32
94 (new claim 143) "sucrose and trehalose"	Page 26, lines 11 and 20

Rejections Under 35 U.S.C. § 102(e)

A. Claims 61-75 and 77-97 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 5,910,306 ('306).

Claims 61-97 have been canceled and replaced with new claims 98-146, which are directed to the same invention as claims 61-97. Claim 98 and its dependent claims 99-146 are directed to a method of inducing an immune response comprising applying a dry formulation to the skin of a subject, wherein the formulation comprises an antigen and an adjuvant.

The Office Action alleges that claims 61-75 and 77-97 are anticipated by '306 because it teaches that liposomes containing antigen and adjuvant can be lyophilized and discloses application of the formulation to dry skin of subject. However, the passages cited by the Office Action (col. 4, lines 28-35 and col. 12, Example 2) as disclosing dry or lyophilized formulations teaches mixing antigen dissolved or suspended in solution with lyophilized liposomes. Once the lyophilized liposomes are mixed with the antigen dissolved or suspended in solution, the mixture

becomes a solution, not a lyophilized dry formulation. Applicants respectfully point out that the liposomes in '306 are formed by mixing lipid in organic solvent and lyophilized. The antigen dissolved or suspended in solution is then added to the lyophilized liposomes to form an aqueous solution. The cited patent does not teach lyophilizing the formulation containing antigen and liposome. Thus, the cited patent does not disclose dry formulation. Rather, the cited patent discloses formulations prepared by mixing lyophilized liposomes with antigens that were dissolved or suspended in solution. Accordingly, the formulations comprising liposomes and antigen disclosed by '306 are not dry formulations (see U.S. Patent 5,910,306, col. 4, lines 33-35 and col. 12, Example 2). Therefore, the cited patent does not anticipate the new claims 98-146.

B. Claims 61-97 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 5,980,898 ('898).

Likewise, the Office Action alleges that the '898 discloses liposomes containing antigen and adjuvant in lyophilized form. However, the passages cited by the Office Action as disclosing dry formulation (col. 11, lines 60-65) teaches mixing antigen dissolved or suspended in solution and added to lyophilized liposomes. Once the lyophilized liposomes are mixed with the antigen dissolved or suspended in solution, the mixture becomes a solution, not a lyophilized dry formulation. The cited patent does not teach lyophilizing the formulation containing antigen and liposome. Thus, the cited patent does not disclose dry formulation. Rather, '898 discloses formulations prepared by mixing lyophilized liposomes with antigens that were dissolved or suspended in solution (col. 11, line 63 to 65 and col. 12, lines 36-39). Accordingly, the formulations comprising liposomes and antigen disclosed by '898 are not dry formulations.

The Office Action also cites col. 12, lines 44-46 of '898 as disclosing dry formulation. Applicants respectfully point out that lines 44-46 of the cited patent by stating, "although not required to practice the present invention, hydration and/or penetration of the stratum corneum may be enhanced by adding liposomes to the formulations," only suggests that liposomes may be added to enhance hydration of the skin. This statement does not teach or show applying dry formulation to the skin of the subject.

Thus, the cited patent does not anticipate the invention of new claims 98-146.

C. Claims 61-97 are rejected under 35 U.S.C. § 102 (e) as being anticipated by U.S. Patent 6,797,276.

As discussed above, claims 61-97 have been replaced with new claims 98-146. Applicants respectfully submit that the cited patent does not anticipate new claims 98-146. As discussed above, claim 98 and its dependent claims 99-146 are directed to a method of inducing an immune response comprising applying a dry formulation to the skin of a subject, wherein the formulation comprises an antigen and an adjuvant.

The Office Action alleges that the cited patent teaches a method of inducing immune response comprising administering a dry formulation because the cited patent discloses that the antigenic formulation can be utilized with vehicles encompassing powder.

Applicants respectfully point out that the cited patent does not teach dry formulation for inducing an immune response. The cited patent discloses pretreatment of the skin prior to administering a formulation comprising an antigen. The paragraph (col. 8, line 25 of U.S. Patent 6,797,276) that the Office Action referred to teaches that the skin may be hydrated or made permeable by using various vehicles including powder. This paragraph does not teach or disclose applying dry formulations comprising antigen to the skin of a subject. As shown in the Examples of U.S. Patent 6,797,276, the formulations that were applied to the skin of the subject were wet formulations, *i.e.* solutions.

The Office Action alleges that claims 1-11 and col. 8, line 25 of the cited patent discloses a method of inducing an immune response with a dry formulation. Applicants respectfully submit neither the claims nor the specification of the cited patent discloses applying dry formulation to induce an immune response. Col. 8, line 25, as mentioned above, discusses the various "vehicles" that may be used to hydrate the skin which is pretreatment of the skin. The cited patent teaches that the "vehicles" that may be used to treat the skin includes humectants, powders, emulsions, and occlusive dressing. The cited patent does not teach or disclose that the formulations used with these "vehicles" must be dry formulations, and the cited patent does not disclose a method of inducing an immune response comprising applying a dry formulation to the skin of a subject. Thus, even though the cited patent discloses pretreating the skin with alcohol, the cited patent does not teach applying dry formulation to pretreated skin.

In contrast, new claims 98-146 are directed to a method of inducing an immune response by applying a dry formulation to the skin of a subject. Accordingly, the cited patent does not anticipate the invention of new claims 98-146.

Rejection Under 35 U.S.C. § 103(a)

Claims 61, 75, and 76 are rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent 5,910,306 in view U.S. Patent 5,988,898.

As discussed above, claims 61-97 have been canceled and replaced with new claims 98-146. Applicants respectfully submits that the cited patents do not render new claims 98-146 obvious.

The deficiencies of the cited patents are discussed immediately above. The cited references do not disclose applying dry formulations comprising an antigen to the skin of a subject to induce an immune response. The formulations disclosed in the cited patents are solutions comprising antigen and liposomes. The cited patents do not provide evidence that a dry formulation would induce an immune response. Thus, the cited patents do not provide motivation to modify their teachings and to obtain a method of inducing an immune response by applying dry formulations.

Accordingly, the cited patents do not render the claimed invention obvious.

Non-Statutory Double Patenting

A. Claims 61-97 are provisionally rejected under the judicially created doctrine of double patenting over pending claims 106-159 of copending application 10/790,715, claims 1-40 of copending application 11/334,349, and claims 70-97 of copending application 11/141,690.

B. Claims 61-83 are provisionally rejected under the judicially created doctrine of double patenting over claims 89-107 of copending application 11/514,462 and claims 102-105, 107-120 of copending application 11/109,948.

Claims 61-97 have been replaced with new claims 98-146 which are directed to the same invention as new claims 61-97.

Applicants respectfully submit that although copending applications 10/790,715; 11/334,349; and 11/103,948 disclose methods of inducing an immune response by applying a

formulation to the skin of a subject, these copending applications do not teach or suggest dry formulations for inducing an immune response. Moreover, the claims of these copending applications are not directed to methods of inducing an immune response using a dry formulation. In contrast, the claimed invention of the present application are directed to methods of inducing an immune response by applying a dry formulation comprising an antigen and an adjuvant to the skin of a subject to induce an immune response.

The claimed invention of the present application is not an obvious variant of the claimed inventions of the copending applications for the reasons set forth in the declaration by Dr. Robert Seid, Jr. As described in the declaration, prior to the present invention, it was thought that a wet formulation would be more effective than a dry formulation in inducing an immune response by transcutaneous immunization. The reason is that with a wet formulation, water serves as a medium to facilitate the solubilized antigen molecules to diffuse through the outer layers of the skin and into the skin. In contrast, with a dry formulation, the antigen molecules are entrapped or suspended in a solid formulation matrix, since the bulk water has been removed. However, the results of the clinical trial performed by Iomai to assess the effect of a patch containing a wet formulation and a patch containing a dry formulation demonstrated that a dry patch is more effective than a wet patch in delivering antigens transcutaneously into the skin of a subject to induce an immune response. The results of the clinical trial showed that a dry formulation induced an immune response that is significantly greater than that induced by a wet formulation. As discussed in detail in the declaration, the results were surprising and unexpected to the scientists at Iomai.

Accordingly, Applicants respectfully submit that the claimed invention of the present invention is not an obvious variant of the inventions of the referenced copending applications.

Without acquiescing to the propriety of the provisional obviousness type double patenting rejection over copending application 11/141,690, Applicants respectfully point out that this is a provisional rejection between two copending applications. MPEP 804 (I)(B) (page 800-19) states,

> If the "provisional" double patenting rejection in one application is the only rejection remaining in that application, the examiner should then withdraw that rejection and permit the application to issue as a patent, thereby converting the "provisional" double patenting rejection in the other application(s) into a double patenting rejection at the time the one application issues as a patent.

Thus, if this is the remaining rejection in this application, Applicants respectfully request withdrawal of this rejection in accordance with MPEP 804 (I)(B).

Regarding copending application 11/514,462, it appears that the Office Action has cited an incorrect copending application, since Applicants are not familiar with copending application 11/514,462. During the phone conference, the Examiner confirmed that the cited application number is incorrect. The correct application number is 11/516,462. If the Office intended to provisionally reject claims 61-83 over copending application 11/516,462, Applicants respectfully submit that a new rejection should be introduced in the next Office Action.

Nevertheless, Applicants respectfully submit that the claims in application 11/516,462 is directed to a device and to methods of using the device to treat the skin of the subject. The present invention is directed to a method of inducing an immune response comprising applying a dry formulation comprising an antigen and an adjuvant to the skin of a subject. The present application do not teach or suggest the device disclosed by copending application No 11/516,462, and the claims of the present application are not directed to the device or methods of using the device of application 11/516,462 to treat the skin of a subject. Thus, the claimed invention of the present application is not an obvious variant of the invention of application 11/516,462.

C. Claims 61 and 84-86 are provisionally rejected under judicially created doctrine of double patenting over claims 18, 21, and 22 of copending application 10/472,598.

Applicants respectfully submit that application 10/472,598 is no longer pending. Thus, withdrawal of this rejection is requested.

CONCLUSION

The foregoing amendments and remarks are being made to place the application in condition for allowance. Applicants respectfully request entry of the amendments, reconsideration, and the timely allowance of the pending claims. A favorable action is awaited. Should the Examiner find that an interview would be helpful to further prosecution of this application, she is invited to telephone the undersigned at their convenience.

If there are any additional fees due in connection with the filing of this response, please

charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. §1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

MORGAN, LEWIS & BOCKIUS LLP

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By: _____
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